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PATENT ABSTRACTS OF JAPAN

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(71)Applicant : MATSUSHITA ELECTRIC IND CO LTD

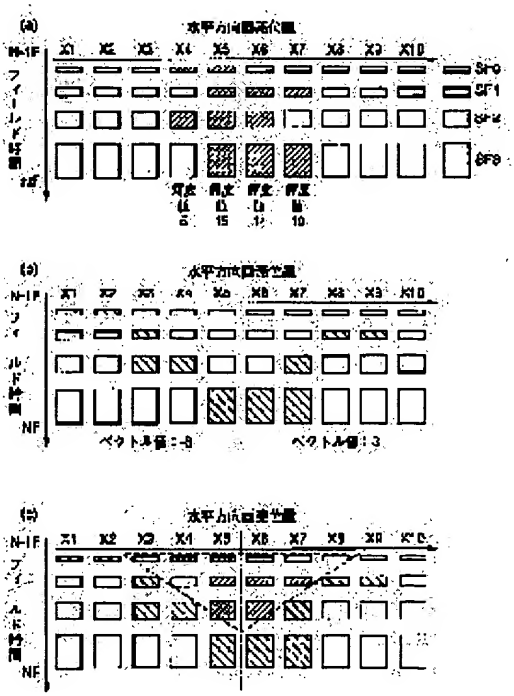
(72)Inventor : MAEKAWA YOSHINORI
FUKUSHIMA HIROMASA
TOKOI MASAKI
KAWAMURA HIDEAKI

(54) HALFTONE DISPLAY METHOD FOR DISPLAY DEVICE

(57)Abstract:

PROBLEM TO BE SOLVED: To provide a means suppressing the pseudo counter of a moving picture from being generated by eliminating the degradation of a picture quality due to picture noise even in parts in which movement vector values are different in adjacent pixels or picture blocks.

SOLUTION: Relating to an intra-field time-division display device, in a halftone display method in which, at first, a movement vector is detected and a moving processing moving light emitting positions of respective subfields with respect to display data of a prescribed field is applied, the presence or absence of light emissions of the subfields is determined based on original information prior to the applying of the moving processing of the light emitting positions of the subfields as to subfields which are to be removed from light emitting objects completely, resulting from that light emitting positions of the subfields are moved.



LEGAL STATUS

[Date of request for examination]

* NOTICES *

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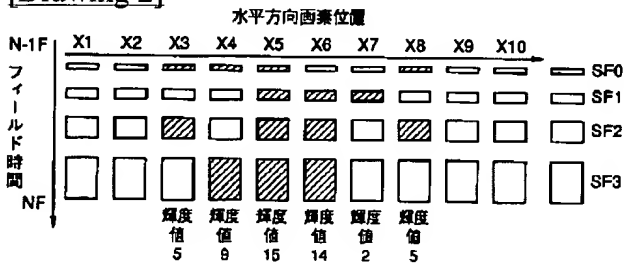
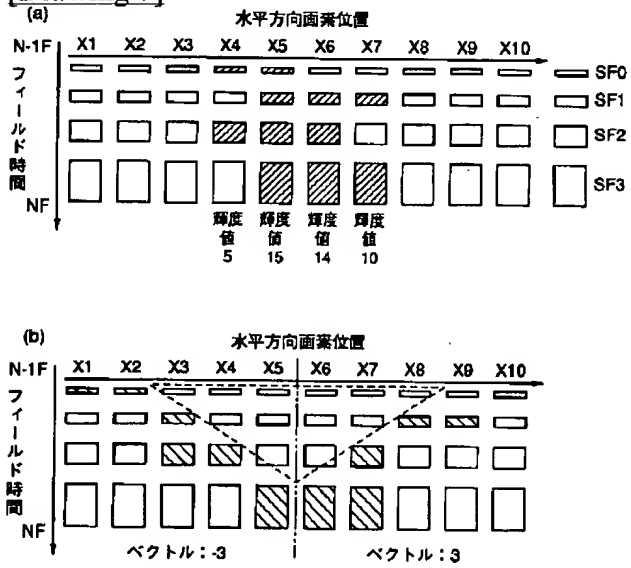
DRAWINGS

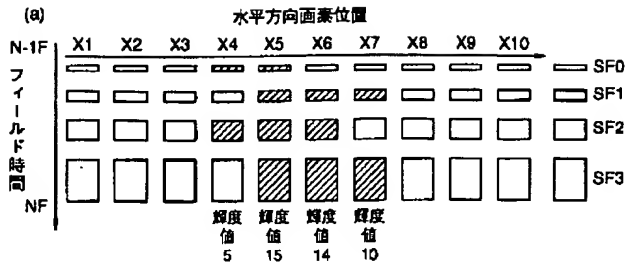
[Drawing 2]

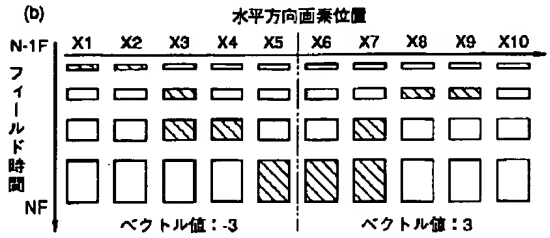


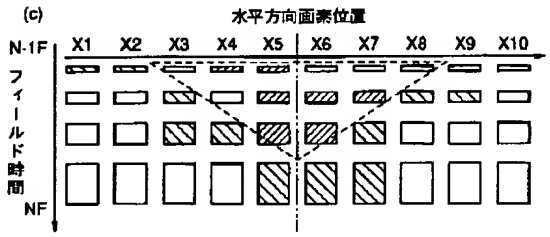
[Drawing 7]



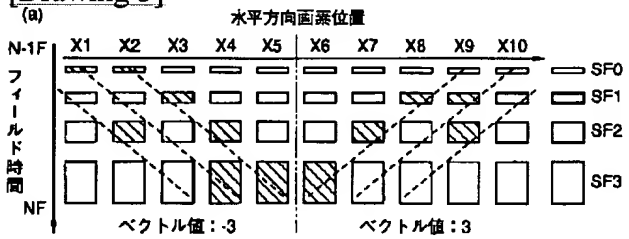
[Drawing 1]

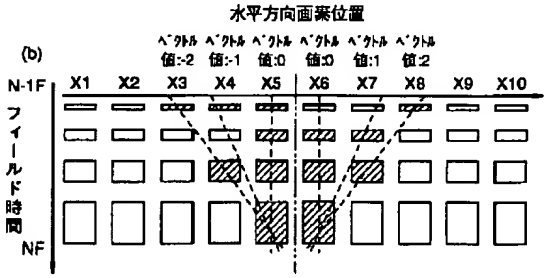


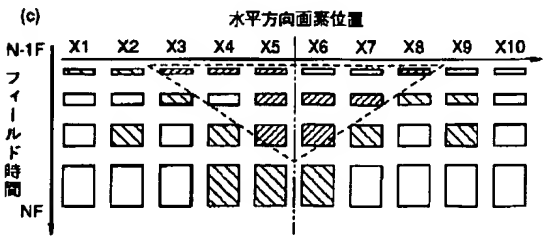




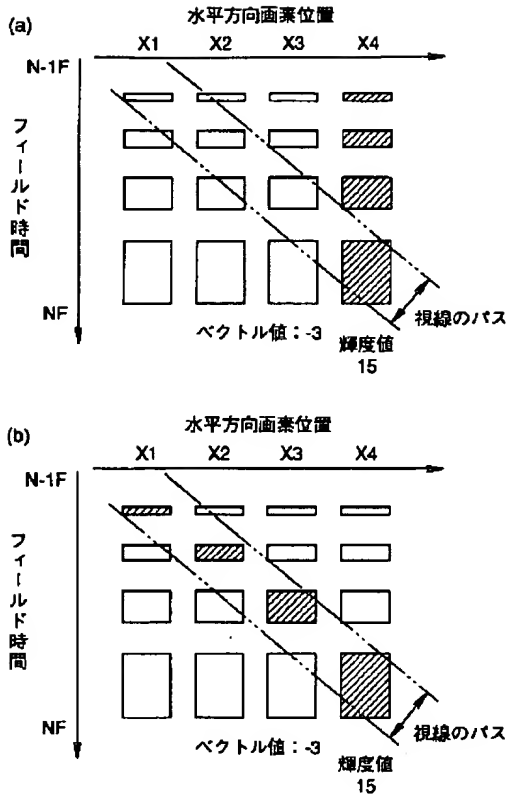
[Drawing 3]



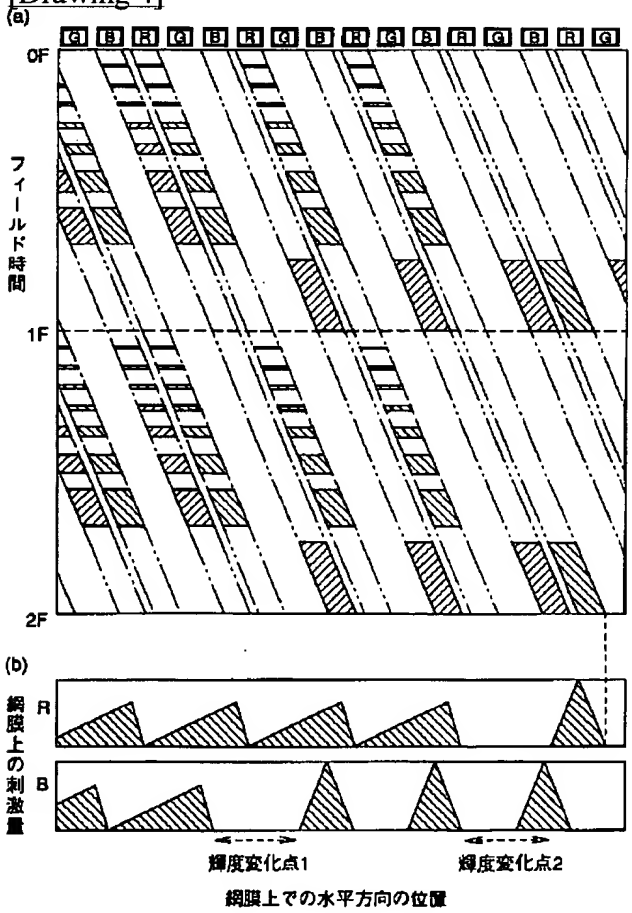




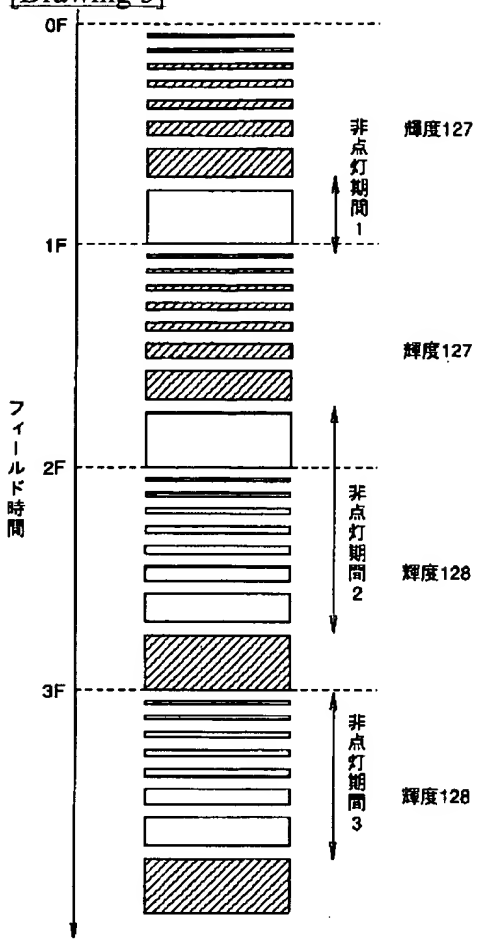
[Drawing 6]


(a)
水平方向画素位置
X1
X2
X3
X4
N-1F
フィールド時間
NF
ベクトル値：-3
視線のパス
輝度値
15
(b)
水平方向画素位置
X1
X2
X3
X4
N-1F
フィールド時間
NF
ベクトル値：-3
視線のパス
輝度値
15

[Drawing 4]


(a)
0F
フィールド時間
1F
2F
(b)
網膜上の刺激量
R
B
輝度変化点1
輝度変化点2
網膜上での水平方向の位置

[Drawing 5]



[Translation done.]

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DETAILED DESCRIPTION

[Detailed Description of the Invention]
[0001]
[The technical field to which invention belongs] this invention relates to the display unit which performs a halftone display by the time-sharing method in the field, for example, the method of presentation which suppresses generating of the animation false profile produced in the dynamic-image section of a discharge-in-gases panel.
[0002]
[Description of the Prior Art] Two or more screens where the weight of brightness differs the picture of the 1 field displayed on a display unit (these are hereafter called "subfield".) moreover, N subfields shall exist in the following explanation Generating this, since the time heterogeneity of the luminescence scheme of the display cell (pixel) of a panel is changed into spatial heterogeneity by the movement of the visual axis which follows an image is known.
[0003] This phenomenon is explained in detail to a slight degree. First, if the time-sharing method in the field is described, .. and time weighting of ** (N-1) of 2 will be performed to the subfield of N sheets which constitutes the 1 field from this method the 0th power of 2, and the 1st power of 2, respectively. The subfield [SF (N-1)] which performed a least significant bit (hereafter referred to as "LSB".) and time weighting of ** (N-1) of 2 for the subfield [SF0] which performed time weighting of the 0th power of two among these subfields is called most significant bit (hereafter referred to as "MSB".). The halftone brightness in 1 field is performed by choosing the existence of luminescence of each subfield. And the brightness which human being's eyes sense is expressed with the sum of the amount of brightness of each luminescence subfield by the visual-sense property of human being's eyes, i.e., the decay characteristic. the time-sharing method in the field mentioned above -- MSB from LSB -- or when luminescence moves from MSB to LSB between subfields, the position of the luminescence subfield in the field may change a lot, and, for the reason, a bird clapper has a luminescence scheme unevenly in time If a view moves at this time, the time unevenness will be changed into spatial unevenness, and, for this reason, an animation false profile will occur.
[0004] An example of the mechanism which this animation false profile generates is shown in drawing 4 . The emission band of the magenta which consists of a red pixel (it considers as "R cell" below.) in which the number N of subfields had change of gradation by 8, and a blue pixel (it considers as a "bursa equivalent cell" below.) is horizontal, and the case where a view follows movement of the emission band of a magenta in the case of moving to the left by three cells is expressed with this drawing 4 . Drawing 4 (a) which took the position where a cell is horizontal along the horizontal axis, and took field time along the vertical axis expresses the state of the luminescence subfield which a retina recognizes on the basis of the position a luminescence subfield is first recognized to be on a retina. In addition, when an eye follows the picture which moves horizontally to the left, the stimulus which each subfield gives on a retina will move to the right relatively with time.
[0005] Drawing 4 (b) is in the state of drawing 4 (a), and expresses the distribution of the quantity of stimulus of the light which each cell of an emitter gives to a retina. And when the brightness of a bursa equivalent cell changes to 128 from 127 and a retina expresses the state of recognizing a luminescence subfield, in the state of field time and a subfield by drawing 4 , it comes to be shown in drawing 5 . This drawing 5 shows that the period non-emitting light is long at the changing point of brightness. This is the same also about R cell. And it is horizontal, change of the brightness of the bursa equivalent cell of an emission band and R cell which moves to the left shifted in time, and is generated, the changing point to the brightness 127-128 of a bursa equivalent cell and each R cell, i.e., the part corresponding to the portion of the period non-emitting light which becomes large, became the gap portion which does

not receive a stimulus on a retina, and it has appeared. That is, it turns out that the time property in brightness change is changed into the spatial property.

[0006] In the field of the point 1 of drawing 4 (b) changing [brightness], it becomes luminescence of only R cell and a retina recognizes the emission band of a magenta as a red line. Moreover, in the field of the point 2 changing [brightness], it becomes luminescence of only a bursa equivalent cell and a retina recognizes the emission band of a magenta as a blue line. Thus, when color display is performed, an animation false profile will appear as disorder of a color. As a method of solving the problem of this animation false profile, the method of correcting to the position which detected the motion vector to every cell or cell block (for example, 16x16 cells), asked for the luminescence position for every subfield actually perceived by the retina from the motion vector, and asked for the luminescence position of each subfield of an original indicative data previously from the indicative data between the fields is proposed with the halftone method of presentation and the halftone display which were indicated by JP,8-211848,A.

[0007] It explains referring to drawing 6 about this technique. Drawing 6 takes field time along a vertical axis, and takes the horizontal position of a cell along a horizontal axis, and the indicative data when setting the number of subfields to 4 is expressed. Moreover, the slash section in drawing is a luminescence subfield. In drawing 6 (a), although an original indicative data is a luminescence subfield shown in the slash section in drawing when an indicative data carries out 3 cell movement per vector value 3, i.e., the 1 field, horizontally, what a retina actually recognizes is the luminescence subfield group of the range surrounded with the two-point dashed line. That is, the indicative data which a retina actually recognizes differs from an original indicative data. Then, an original indicative data and the indicative data which a retina actually catches are made in agreement by moving the luminescence position of each subfield which constitutes an original indicative data to the field surrounded with the two-point dashed line in drawing 6 (a). Drawing 6 (b) showed this situation. That is, an animation false profile is amended by changing the display position of each luminescence subfield along with the path of a visual axis.

[0008]

[Problem(s) to be Solved by the Invention]